

TOOL HOLDER

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The invention relates to a tool holder, and more particularly, a rotary
5 tool holder for releasably holding rotary tool holders for precise cutting or grinding
operations.

Description of the Background Art

[0002] Rotary tapered tool holders, commonly referred to as "steep taper" tool
holders, are well known in the art. Steep taper tool holders have a male tapered
10 portion extending from a V-flange portion. The V-flange portion has a V-shaped
groove to assist the machine tool changer mechanism in gripping the tool. In the
U.S., one of the most common steep taper tool holder designs is the Caterpillar V-
flange tool holder, generally referred to as a "CV" tool holder. CV tool holders are
one of several standards for very similar tool holder designs, all of which have 7/24
15 tapers (7 inches of diameter change per 24 inches of length.) Another common 7/24
tapered tool holder standard is the "BT" tool holder.

[0003] The tapered shank portion of the steep taper tool holder is held in a
corresponding female tapered portion of a spindle. The tool holder is held in and
rotated at high speeds by the spindle. There are generally two types of steep taper
20 tool holders: (1) taper-only contact tool holders, in which only the tapered surface of
the tool holder contacts the tapered inside surface of the spindle; and (2) face-taper
contact tool holders, wherein the face of the tool holder flange is in contact with the
face of the spindle in addition to surface contact between the tapered portion of the
tool holder and the spindle. The face-taper contact type tool holder can require a
25 specially designed spindle, wherein the mating face of the spindle is machined more
precisely to facilitate operating in contact with the face of the tool holder V-flange
portion.

[0004] Conventional steep taper tool holders of both types can suffer from
certain problems. For example, in a standard steep taper tool holder the taper
30 tolerances for tool holder taper and spindle taper produce a situation wherein the
adjacent tapers are in hard contact at the front, but may be out of contact at the rear.